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Laboratory Gins and Tests of Reliability of Ginning With Different Sizes of Seed Cotton Lots

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AGRONOMISTS and geneticists have emphasized the growing demand for small laboratory cotton gins upon which seed cotton from selected plants and specimen bolls can be ginned. In a few instances, when the need for these gins extends only to the rapid removal of the fiber from the seed for cursory examinations or seed preservation, the distinction between appearance and preparation of roller or saw-ginned samples has no special importance. In the majority of cases, however, the availability of small laboratory gins enables the cotton breeder to get significant appraisals of his samples on the basis of fiber tests and commercial classification in its several aspects and in addition provides means for determining turn-out and other characteristics of the specimen lot.

The most important factor to be considered in the ginning of small lots of cotton is the reliability and accuracy of lint-percentage figures for the various small gins now in use. This information may be of great assistance to cotton research workers in ascertaining the size of lot necessary to get the degree of accuracy desired for determining yields on the basis of ginning a small sample of the cotton from a field or plot.

Lint turn-out from lots of cotton ginned on small laboratory gins is influenced to a great extent by such factors as (1) size of lot used,

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(2) errors in ginning caused by failure to maintain the same seed-roll density, (3) time of dumping the seed roll toward the end of the ginning test, (4) lint becoming hung up in the lint flue, (5) improper mixing of the cotton prior to ginning, thus preventing a representative sample of the lot from being obtained, (6) failure to take a sufficient number of samples to give reliable results, and (7) sensitivity of balances used in weighing the samples.

Quinby and Stephens[1] made studies of methods of taking samples and of the accuracy of the lint percentage determined from cotton ginned on small laboratory gins. They found that a 10-pound sample ginned on a 20-saw gin had a probable error of 0.18 percent lint, whereas a 200-gram sample ginned on an 8-saw gin had a probable error of 0.37 percent. They concluded that one 10-pound sample from a plot was accurate enough to determine the lint percentage.

J. T. Vantine[2] made studies on twenty 10-pound samples ginned on a 20-saw gin and fifty 200-gram and fifty 50-gram samples of the same lot of seed cotton ginned on an 8-saw gin to determine the accuracy of lint-percentage figures. He concluded that one representative sample carefully handled is sufficient for reliable determination. There were significant variations between the different sizes of samples used, but these were small and in view of other experimental errors the correction for variation is not warranted.

Since lint turn-out is of great importance to research workers in cotton, being the basic figure used in calculating yield of lint from a given weight of seed cotton, the United States Cotton Ginning Laboratory conducted a series of tests to determine the minimum quantity of seed cotton necessary to obtain a reliable lint turn-out percentage for the various small laboratory gins[3] now in use. This study may be summarized as follows.

SUMMARY

If the lint turn-out is to be determined on the basis of the results from ginning small samples on experimental gins, one of the most important factors to be considered is the sampling procedure. A representative sample can be obtained by thoroughly mixing the entire yield of each plot, and then sampling; or by taking a composite sample of quantities in proportion to the yields of each picking.

The tests indicate that the lint turn-out is affected appreciably by the lot size of seed cotton ginned.

In determining the lot size necessary for the desired degree of accuracy in turn-out the type of gin, whether saw or roller, must be considered. If the ginning is to be done on a saw gin the size of the gin also is important.

The lint turn-out is generally more constant when the ginning is done without a prepared seed roll.

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[1] QUINBY, J. R., and STEPHENS, J. C. THE ACCURACY OF COTTON LINT PERCENTAGE FIGURES. Jour. Amer. Soc. Agron. 22: 157–163. 1930.

[2] VANTINE, J. T. ACCURACY OF THE PERCENTAGE OF LINT COTTON DETERMINED ON SMALL LABORATORY GINS. Jour. Amer. Soc. Agron. 26: 531–533. 1934.

[3] Working drawings of the laboratory gins described in this publication may be obtained from the U. S. Cotton Ginning Laboratory, Stoneville, Miss.

When the different lot sizes were ginned in the 10-inch 20-saw gin without a seed roll the standard deviations of lint turn-out from the 8-pound lot were comparable with those obtained by Quinby and Stephens from the 10-pound lot. These tests indicate, however, that greater accuracy and reliability of turn-out can be attained by ginning lots of 32 pounds.

A sample of 800 grams seems to be large enough to give reasonably accurate lint turn-out percentage when the ginning is done in a 10-inch 20-saw gin without the use of seed rolls, although the tests indicate that with more accurate balances than were available for weighing the larger lots greater reliability might be expected from 4-, 8-, or 16-pound lot sizes.

When the 6-inch 8-saw laboratory gin was used there was little difference between the standard deviation of lint turn-out from the various lot sizes resulting from ginning with or without seed rolls. Since, however, it can be done more conveniently and in less time, ginning without seed rolls probably is preferable in most instances. Lot sizes of 400 grams appear adequate for determining lint percentage with this gin.

The effect of lot size on lint turn-out was not so pronounced with the roller gins as with the saw gins. Turn-out was somewhat higher when the cotton was roller ginned than when it was saw ginned.

The 800-gram sample gave the most reliable results when ginning with the 8-inch roller gin.

The reliability of turn-out from the 16-inch roller gin was greatest when samples of 1,600 grams were used, although there was practically no difference between results from this lot size and the 800-gram size.

Throughout the tests there was a tendency for the grade of lint to be lowered as the lot size increased except when the long staple cotton was ginned on roller gins.

COTTON EQUIPMENT AND METHODS

In these tests two metal-frame roller gins with rollers 8 inches and 16 inches in length, constructed at the United States Cotton Ginning Laboratory, were used.[4] Salient operating features of these gins are shown in table 1. The saw gins were a 6-inch 8-saw, designed and built at the United States Cotton Ginning Laboratory, and a 10-inch 20-saw, representing commercial types manufactured in 10-, 16-, and 20-saw models for use by experiment stations and plant breeders. By using a dividing board placed in the middle of the roll box of the 10-inch 20-saw gin, the 10-inch 10-saw series of tests were obtained from the same gin. Comparative operating features and speeds are shown in table 2. Both saw gins were of the brush type with built-in condenser and had approximately the same shape and number of teeth per inch of saw circumference.

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[4] Credit is due James S. Townsend, formerly cotton technologist, Division of Cotton and Other Fiber Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, for design and supervision of construction of these small roller gins.

TABLE 1.—*Comparative elements of laboratory-design small roller gins*

Items of comparison	Size of gin	
	8-inch roller	16-inch roller
Roller speed r. p. m.	75	100
Crank speed do	365	500
Roller diameter inches	4½	6
Core diameter do	3¼	4½
Motor size hp	⅓	1

TABLE 2.—*Comparative elements of laboratory-design small saw gins*

Items of comparison	Size of gin	
	6-inch 8-saw	10 inch 10- or 20-saw
Saw speed r. p. m.	290	520
Brush speed do	1, 740	1, 720
Teeth per saw number	132	235
Teeth per saw per inch of circle do	7¼	7¼
Motor size hp	⅓ or ½	3

The seed cottons used in this study were selected as representative of pure varieties of uniform types of American upland cotton—a long staple, 1$\frac{3}{16}$ inches, grown on the Delta Experiment Station, Stoneville, Miss.; and a short staple, $\frac{15}{16}$ inch, grown on the Louisiana Experiment Station, Baton Rouge. Picking and handling were performed under the supervision of a representative of the Ginning Laboratory. Since moisture content has a decided effect on ginning efficiency, both lots were stored until equilibrium was reached and remained fairly constant during the time required for the tests.

The scales or balances used were a triple-beam balance sensitive to 0.01 gram for weighing the samples ranging from 6.25 to 50 grams, a balance sensitive to 0.1 gram for weighing 100- to 1,600-gram samples, and a small platform scale sensitive to 0.01 pound for weighing the 4- to 32-pound lots.

Before ginning, each lot of seed cotton was carefully composited and mixed to insure uniform distribution of all physical characteristics. It was then divided into five lots, corresponding to the quantity of cotton needed for each gin. Ten replicate samples were ginned on each lot size so that the accuracy and reliability of each average could be determined. The tests on the saw gins were ginned first with a seed roll and then repeated without it.

In each series of tests the lots were ginned in order from the smallest to the largest. After each sample had been ginned both the lint cotton and the cottonseed were weighed so as to provide a check on the original weighing and to determine lint turn-out. Since the cotton used was relatively clean, the turn-out based on the ratio of the weight of the lint to the weight of the original lot was used. Samples of lint and seed were retained for classification and laboratory analyses.

Variability, measured in terms of standard deviations computed for each sample size from 10 samples of that size, was used as a means of determining the relative reliability of data obtained for each.

8-Inch Roller Gin

The 8-inch roller gin illustrated in figure 1 is constructed with cast-iron flanged sides that comprise the frame chassis, upon which are mounted improved designs of cast-iron slides for the moving knife and reamed bearings for the roller. These bearings assure greater sturdiness, better performance, less vibration, and longer life to the moving parts, and adjustments for each type further contribute to stability of settings.

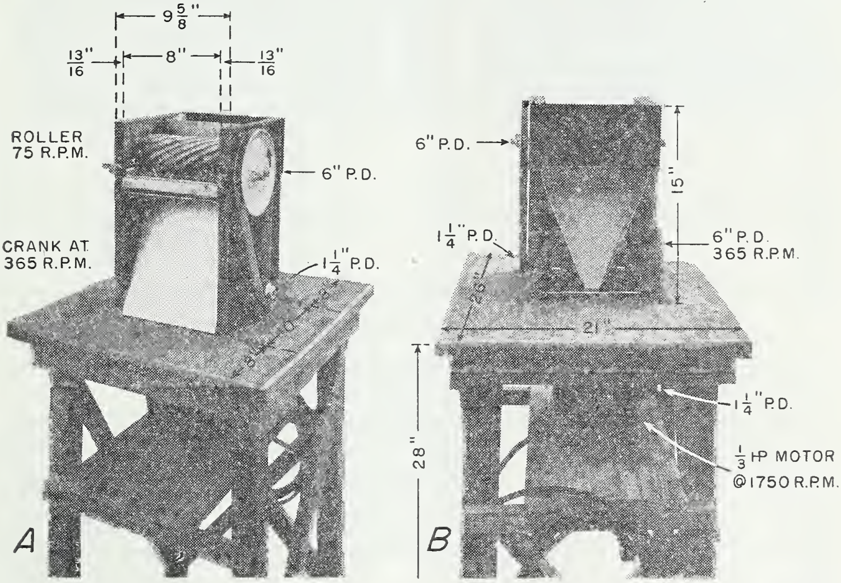

Figure 1.—Laboratory-design 8-inch roller gin, motor driven, mounted on special stand with motor underneath. *A*, Front view and, *B*, rear view.

The roller,[5] or actual ginning mechanism, is 8 inches long and 4½ inches in diameter. It consists of a wooden core covered with strips of walrus hide or composition-rubber packing and is operated at a speed of 75 revolutions per minute. As the cotton comes in contact with the roller, the fibers cling to its covering and are pulled between the roller and a fixed knife set almost tangent to the roller. The cleaned seed is discharged through a stationary grid. A crank speed of 365 revolutions per minute for the moving knife is recommended for optimum performance.

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[5] For detailed discussion on roller gin construction and operation, see Townsend, J. S., Walton, T. C., and Martin, W. J. roller-gin construction, maintenance, and operation. U. S. Bur. Plant Ind. Soils, and Agr. Engin. and Agr. Market. Serv. Preliminary Report, 14 pp., illus. 1940 [Processed.]

Table 3.—*Effect of lot size of cotton on gin turn-out and grade of lint when ginned on an 8-inch roller gin*

Size of lot (grams)	Long staple				Short staple			
	Lint turn-out		Grade		Lint turn-out		Grade	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
	Percent	*Percent*	*Index*	*Percent*	*Percent*	*Percent*	*Index*	*Percent*
6.25	31.7	0.71	6.0	0	35.0	0.94	5.1	0.30
12.5	32.2	.54	6.0	0	35.3	.94	5.0	0
25	32.3	.64	6.0	0	35.3	.33	5.1	.30
50	32.2	.58	6.0	0	35.3	.48	5.2	.40
100	32.0	.60	6.0	0	35.0	.29	5.3	.46
200	31.8	.60	6.0	0	35.4	.37	5.6	.49
400	31.8	.32	6.0	0	35.0	.23	5.6	.49
800	31.8	.23	6.0	0	35.0	.14	5.6	.49

Lot sizes of 6¼, 12½, 25, 50, 100, 200, 400, and 800 grams were used. The results of the tests are presented in table 3.

From the construction and the nature of operation of the roller gin, it is apparent that the small quantities of seed cotton can be ginned as completely as the large. This is borne out by the fact that lint turn-out neither increased nor decreased appreciably with changes in lot size. Consequently variations in lint turn-out from the small lots are due largely to greater errors in sampling as indicated by the standard deviations.

The standard deviations of the lint turn-out from the 800-gram sample, 0.23 percent for the long staple cotton and 0.14 for the short, indicate that when this lot size is ginned the error in lint turn-out on the basis of 1,000 pounds of seed cotton does not exceed 6.9 and 4.2 pounds, respectively.

Lint quality on the long staple cotton as determined by the classers' designation was not affected by the size of the lot ginned but on the short staple cotton the grade was adversely affected as the size of the lot was increased.

One operator can gin approximately 12 pounds per hour or forty 800-gram samples per 8-hour day.

16-INCH ROLLER GIN

Detailed dimensions of the laboratory 16-inch roller gin constructed with structural steel and sheet metal frames are shown in figure 2.

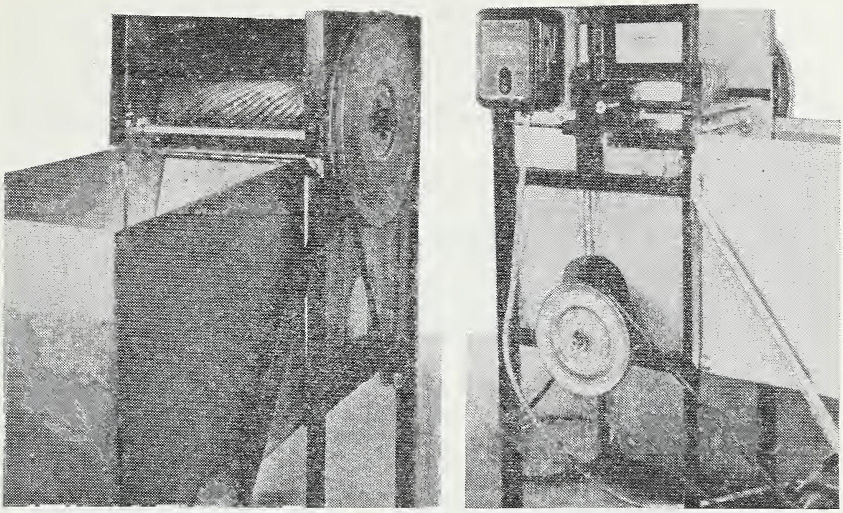

FIGURE 2.—Left- and right-hand views of the laboratory 16-inch roller gin.

In this series of tests a lot size of 1,600 grams was added to those used on the 8-inch gin. The effects of lot size on lint turn-out and quality are shown in table 4.

TABLE 4.—*Effect of lot size of cotton on gin turn-out and grade of lint when ginned on a 16-inch roller gin*

Size of lot (grams)	Long staple				Short staple			
	Lint turn-out		Grade		Lint turn-out		Grade	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
	Percent	*Percent*	*Index*	*Percent*	*Percent*	*Percent*	*Index*	*Percent*
6.25	32. 2	0. 75	6. 0	0	35. 2	0. 88	5. 5	0. 50
12.5	32. 4	. 64	6. 0	0	35. 3	. 48	5. 3	. 46
25	31. 9	. 67	6. 0	0	35. 3	. 37	5. 4	. 49
50	31. 7	. 68	6. 0	0	35. 3	. 40	5. 5	. 50
100	30. 8	. 73	6. 0	0	35. 3	. 35	5. 5	. 50
200	31. 3	. 55	6. 0	0	35. 0	. 26	5. 9	. 30
400	31. 3	. 57	6. 0	0	35. 0	. 29	5. 8	. 40
800	31. 3	. 27	6. 0	0	35. 1	. 15	6. 0	. 00
1,600	31. 1	. 26	6. 0	0	34. 9	. 14	6. 0	. 00

Although the standard deviation of lint turn-out decreases as the lot sizes increase, the difference between the 800- and 1,600-gram samples is insignificant for both long and short staple cotton. It can be concluded from this that if an 800-gram sample taken from a lot of 1,000 pounds of seed cotton were ginned on this roller gin, the error in lint turn-out would not exceed 8 pounds for the long staple cotton and 4½ for the short.

The grade of lint from various lot sizes was unaffected on the long staple but adversely affected on the short staple cotton as the size of the lot was increased.

The capacity of this gin is about 25 pounds per hour, or eighty 800-gram samples per day.

6-Inch 8-Saw Gin

The special 6-inch 8-saw gin was designed and built at the United States Cotton Ginning Laboratory for small-lot experimental and design purposes. Featured in this design are aluminum sides, ball bearings, built-in condensers, full accessibility, and a back-geared motor that eliminates parts and simplifies the drives. The mote board should be so adjusted that the undesirable substances commonly known as motes can be readily expelled from the lint without loss of good fibers. An inverted metal packing case serves as the working table for this gin (fig. 3).

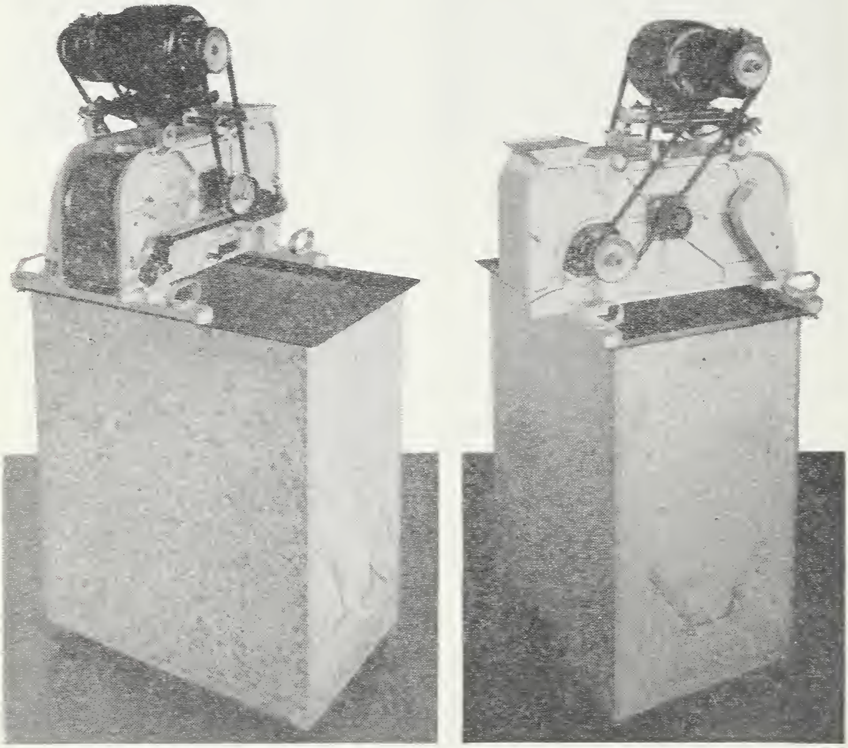

Figure 3.—Left- and right-hand views of 6-inch 8-saw laboratory gin.

The V-belt drives from the back-geared ½-horsepower induction-type motor give a saw speed of 290 revolutions per minute and a brush speed of about 1,750 revolutions per minute. The condenser-screened drum turns 3 revolutions per minute.

In constructing this gin, discarded 10-inch gin saws were repunched to reduced size, but this required an oversize shaft. Saws with center holes punched to suit the designer's lay-out are now available, however, from commercial sources.

Although aluminum side castings on these gins were employed for lightness, other conditions would justify using cast-iron sides.

The general capacity of this small gin is approximately 20 pounds of seed cotton per hour, or fifty 800-gram samples per day.

Lot sizes of 50, 100, 200, 400, 800, and 1,600 grams were used in these tests. Lint turn-out and grade with the standard deviations of the means are shown in table 5.

When ginning with a prepared seed roll on this gin the lint turn-out does not increase appreciably as the lot size is increased, owing probably to the fact that this gin has a small roll box and consequently requires a small seed roll, thus minimizing the error from this source. The standard deviation of 0.34 for the long staple cotton and 0.68 for the short from the 100-gram lot size indicates a high degree of accuracy in lint turn-out with a small quantity of seed cotton.

TABLE 5.—*Effect of lot size of cotton on gin turn-out and grade of lint when ginned on a laboratory 6-inch 8-saw gin*

LONG STAPLE

Size of lot (grams)	Ginned with prepared seed rolls				Ginned without prepared seed rolls			
	Lint turn-out		Grade		Lint turn-out		Grade	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
	Percent	*Percent*	*Index*	*Percent*	*Percent*	*Percent*	*Index*	*Percent*
50	30.6	0.68	4.9	0.54	29.0	0.90	5.1	0.32
100	29.9	.34	5.0	.46	28.9	.38	5.1	.32
200	30.1	.29	5.2	.42	29.0	.30	5.2	.40
400	30.1	.18	5.5	.48	29.5	.19	5.4	.49
800	30.1	.33	5.4	.46	30.0	.29	5.5	.50
1,600	30.1	.30	5.4	.46	29.9	.28	5.5	.50
SHORT STAPLE								
50	34.6	0.47	4.1	0.28	33.5	1.23	4.1	0.21
100	33.6	.68	4.1	.21	33.2	.47	4.3	.39
200	34.0	.36	4.2	.32	33.3	.51	4.6	.40
400	34.4	.24	4.5	.32	33.9	.32	4.5	.43
800	34.4	.25	4.4	.34	34.0	.20	4.8	.15
1,600	34.4	.25	4.6	.28	34.1	.24	4.8	.15

In ginning with a prepared seed roll the smallest standard deviations, 0.18 and 0.24 for the long and short staple cotton, respectively, were obtained with the 400-gram, or slightly less than 1-pound, sample.

When the samples were ginned without a seed roll the smallest standard deviation for lint turn-out from the long staple cotton was 0.19 for the 400-gram lot size. When a representative sample of 400 grams of seed cotton is ginned on this gin without a seed roll, the error in gin turn-out is approximately 8 pounds per 1,000 pounds.

A tendency for the grade of the lint to be lowered is noted for both long and short staple cotton as the size of the lot is increased, whether the ginning is performed with or without a prepared seed roll.

10-INCH 20-SAW GIN

The gin used in tests with a 10-inch 20-saw gin was a commercial brush gin equipped with a flat feeder and single gin condenser and flue, as shown in figure 4. It was operated at a saw speed of 520 revolutions per minute.

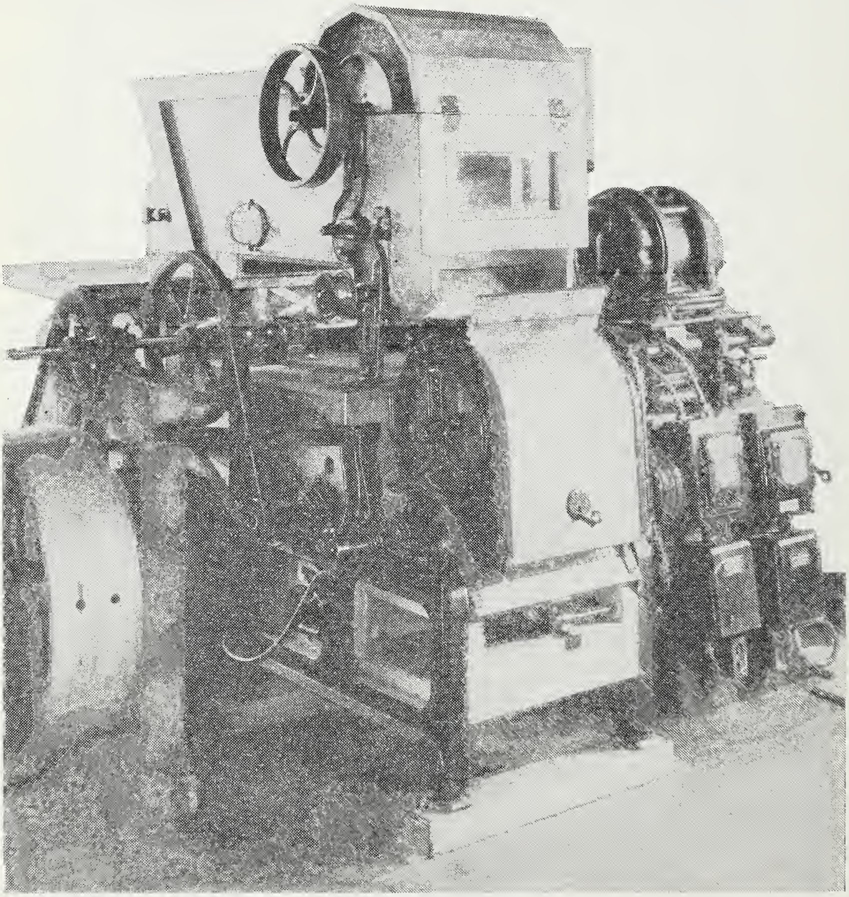

FIGURE 4.—General view of commercial 10-inch saw gin of 20 saws.

Samples of 100, 200, 400, and 800 grams and 4, 8, 16, and 32 pounds were used in the tests, replicated 10 times for each lot size. The lint turn-out and grade, as well as the standard deviations of the mean, are shown in table 6.

Lot size influences lint turn-out considerably. In both the long and short staple cotton ginned with seed rolls, the lint turn-out was markedly higher with the small lots, or the 100- and 200-gram samples, and tended to become more constant when larger lots were used. This additional turn-out, which shows up more in the smaller than in the larger lots, is caused by the gin removing linters fiber from the seed that is in the roll box and putting this fiber in the lint. The standard deviation, like the lint turn-out, tends to decrease as the size of the lot is increased. In general, the standard deviations are smaller with the short staple than with the longer staple cotton.

TABLE 6.—*Effect of lot size of cotton on gin turn-out and grade of lint when ginned on a 10-inch 20-saw gin*

LONG STAPLE

Size of lot	Ginned with seed rolls				Ginned without seed rolls			
	Lint turn-out		Grade		Lint turn-out		Grade	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
	Percent	*Percent*	*Index*	*Percent*	*Percent*	*Percent*	*Index*	*Percent*
100 grams	40. 0	6. 21	4. 4	0. 63	27. 0	2. 51	4. 0	0. 59
200 do	34. 3	2. 79	4. 4	. 39	27. 6	. 55	4. 1	. 21
400 do	31. 3	. 70	4. 6	. 41	27. 8	. 55	4. 3	. 34
800 do	30. 4	. 56	4. 5	. 41	27. 8	. 47	4. 6	. 28
4 pounds	29. 7	1. 22	4. 4	. 30	27. 8	. 60	4. 6	. 35
8 do	29. 8	. 44	4. 6	. 15	28. 6	. 32	4. 7	. 27
16 do	30. 0	. 59	4. 6	. 30	29. 0	. 33	4. 8	. 30
32 do	30. 0	. 70	4. 7	. 30	29. 6	. 19	4. 7	. 27
SHORT STAPLE								
100 grams	40. 6	2. 74	5. 1	0. 30	31. 2	1. 91	4. 2	0. 35
200 do	35. 8	. 71	5. 3	. 46	32. 3	. 57	4. 5	. 41
400 do	34. 5	. 61	5. 3	. 42	32. 4	. 82	4. 7	. 27
800 do	34. 1	. 22	5. 3	. 42	32. 7	. 23	4. 9	. 12
4 pounds	33. 0	. 99	5. 5	. 48	32. 8	. 46	5. 1	. 30
8 do	34. 2	. 74	5. 6	. 49	32. 9	. 29	5. 5	. 50
16 do	34. 3	. 34	5. 7	. 46	33. 0	. 30	5. 8	. 40
32 do	34. 4	. 22	5. 7	. 46	33. 8	. 22	5. 8	. 40

When the cotton was ginned without a seed roll the lint percentage was lowest for the smaller lots and gradually increased with the size of the lot. In ginning without a seed roll it is impossible to keep the gin in operation until all the seed is shed, because the roll will break and stop turning when it becomes too small. This necessitates dumping it. Seed thus dumped is not thoroughly ginned, and the lint remaining on the seed affects the lint turn-out. This will be more pronounced with the small than with the larger lots because the quantity of unginned seed dumped will be constant. These tests indicated that even the 32-pound lots were not large enough to give a desired degree of accuracy or constant turn-out.

When a 4-pound lot was weighed on a small platform scale sensitive to 0.1 pound the standard deviation increased significantly. This shows that in order to get a high degree of accuracy in lint turn-out, it is important to use scales or balances of sufficient accuracy to detect minute differences as well as to use seed cotton lots of sufficient size.

The grade of the lint was affected by the size of the lot, the better grades being associated with the smaller lots for both the long and short staple cottons, ginned with or without seed rolls. Smaller variations between replications, moreover, are associated with the larger lot sizes in most instances, as shown by the standard deviations in table 7. On long staple cotton this difference in grade amounted to 0.6 and 0.7 of a grade between the largest and smallest lots, in favor of the smaller, when ginning with and without seed rolls, respectively. The short staple cotton showed similar but larger differences, in favor of the smallest lot. Since these grades with small lots, however, cannot be duplicated under commercial conditions, the larger lots give more representative results.

10-Inch 10-Saw Gin

By blanking off half the roll box the 10-inch 20-saw gin was converted to perform a series of tests with 10 saws. It was operated at a saw speed of 520 revolutions per minute as recommended by the manufacturer. The weights of the lots used were 100, 200, 400, and 800 grams and 4, 8, and 16 pounds. The lint percentage and grade indices, together with the standard deviations of the means of the replications from this series of tests, are presented in table 7.

When the samples were ginned with a prepared seed roll, the lint turn-out was greater for the small lots and gradually decreased as the size of the lot was increased. The most consistent results were obtained when lots of 800 grams were used, as shown by the standard deviation of the mean—0.39 for the long staple cotton and 0.67 for the short. The larger lots of 4, 8, and 16 pounds gave more inconsistent results because of lack of sensitivity of the balance used.

In ginning without the seed roll it was found that the lint turn-out gradually increased with the use of larger quantities of seed cotton. Results of these tests indicate that the 16-pound lot is not large enough to give reliable lint turn-out percentages from this gin. The balance available for weighing the lots of 4 pounds or larger, however, was not so sensitive as the ones used to weigh the smaller lots, and this accounts for the larger variations. It is probable that greater accuracy in weighing the larger lots would result in standard deviations of lint turn-out small enough to justify the employment of seed cotton lot sizes no larger than 16 pounds in determining turn-out.

Table 7.—*Effect of lot size of cotton on gin turn-out and lint quality when ginned on a 10-inch 10-saw gin*

Long Staple

Size of lot	Ginned with seed rolls				Ginned without seed rolls			
	Lint turn-out		Grade		Lint turn-out		Grade	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
	Percent	*Percent*	*Index*	*Percent*	*Percent*	*Percent*	*Index*	*Percent*
100 grams	33.0	3.69	4.2	0.37	26.7	1.16	4.0	0.00
200 do	30.0	2.16	4.4	.46	27.8	.41	4.1	.21
400 do	29.9	.50	4.6	.40	28.0	.50	4.2	.32
800 do	29.6	.39	4.8	.14	28.3	.29	4.4	.34
4 pounds	29.6	1.04	4.7	.37	28.4	.71	4.5	.32
8 do	29.8	.32	4.8	.30	28.7	.53	4.7	.26
16 do	29.8	.27	4.8	.29	29.2	.83	4.7	.27
Short Staple								
100 grams	42.0	2.10	5.2	0.42	30.8	1.94	4.2	0.37
200 do	33.7	1.98	5.1	.30	31.8	.65	4.3	.43
400 do	33.3	.79	5.8	.40	32.5	.31	4.8	.30
800 do	33.4	.67	5.9	.30	33.0	.26	5.3	.39
4 pounds	33.6	.85	5.7	.45	32.2	.46	5.5	.41
8 do	34.5	.49	5.8	.30	32.6	.29	5.8	.30
16 do	34.3	.39	5.8	.30	33.4	.25	5.8	.30

When ginning long and short staple cotton either with or without a prepared seed roll the grade of the lint was gradually lowered somewhat as the lot size was increased, because the smaller lots were ginned with a looser seed roll than the larger ones. Some of the lots were so small that all the seed cotton could be put in the box at one time, and as the ginning progressed the rolls gradually loosened up until they broke. The larger lot ginnings, however, are more typical of commercial ginning than the smaller lot runs.

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